

**ABSTRACT**

Systems and methods for reducing transmit echo in a transceiver are disclosed. A hybrid echo canceller includes a limited tap length FIR filter to cancel short-term echo, while an interpolated filter is used to cancel the long-tail echo. The limited tap length FIR filter adapts and calculates coefficients for each adapted tap. Taps of the interpolated filter, on the other hand, are adapted but coefficients are calculated for a subset of the taps. Various interpolation schemes may be applied to the calculated coefficients to associate a coefficient with each tap of the interpolated filter. The technique presented produces an effective filter length of  $N$  taps with a reduction in computation and signal processing resources. Preferred embodiments of the echo canceller may be construed as methods for reducing transmit echo. A preferred method includes the steps of: bifurcating a finite impulse response filter in response to the conversion rate of the filter tap coefficients; adaptively calculating and applying a filter tap coefficient to each tap of a short term portion of the bifurcated filter; adaptively calculating a subset of the filter tap coefficients of a long tail portion of the bifurcated filter; and applying an interpolation technique to the remaining set of filter tap coefficients of the long tail portion of the bifurcated filter.

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